

REMARKS

Examiner Isaac is thanked for the continued thorough Search and Examination of the Subject Application for Patent.

Reconsideration of the Rejection of Claims 1-19 under 35 U.S.C. 103(a) as being unpatentable over Zheng et al. (U.S. Pat. No. 5,728,621) in view of Detzel et al. (U.S. Pat. No. 6,287,174) is requested. Claims 1-19 describe methods of planarizing substrates having trenches formed therein. A layer of dielectric is formed on the substrate thereby filling the trenches with the dielectric. A layer of resist is then formed on the layer of dielectric. The substrate is then planarized by removing all of the layer of resist and part of the layer of dielectric using only chemical mechanical polishing with a hard polishing pad, a hardness of at least Shore "D" 52.

Zheng et al. describe forming a layer of high density plasma (HDP) oxide on a substrate having trenches formed therein thereby filling the trenches with HDP oxide, see column 2, lines 43-47. A layer of spin-on-glass is then formed on the layer of HDP oxide, see column 2, line 64 to column 3, line 2. In the planarization step described by Zheng et al. the spin-on-glass and HDP oxide are then etched back using a timed etch to achieve a planar surface, see column 3, lines 16-20 and Fig. 2. Both HDP oxide and spin-on-glass remain on the substrate after this planarization step, see Fig. 2. As an optional step the remaining spin-on-glass material and that part of the HDP oxide which

is not within the trench area can be polished away using chemical mechanical polishing, see column 3, lines 21-25.

There are at least the following significant differences between the methods of claims 1-19 and the invention of Zheng et al. Zheng et al. describe the use of a timed etchback step to planarize the substrate while the methods of Claims 1-19 use only chemical mechanical polishing with a hard polishing pad, a hardness of at least Shore "D" 52. The methods Zheng et al. use a layer of spin-on-glass on the layer of HDP oxide while the methods of Claims 1-19 form a layer of resist on the layer of trench filling dielectric. The timed etchback of Zheng et al. leaves some spin-on-glass on the layer of HDP oxide and requires the use of an optional chemical mechanical polishing step in addition to the timed etchback to remove all to the spin-on-glass. The methods of claims 1-19 removes all of the resist using only the chemical mechanical polishing step using a polishing pad having a hardness of at least Shore "D" 52. The invention of Zheng et al. requires an optional chemical mechanical polishing step in addition to the timed etchback step to remove all of the HDP oxide outside of the trench regions while the methods of claims 1-19 use only chemical mechanical polishing using a polishing pad having a hardness of at least Shore "D" 52 to remove all of the trench dielectric outside the trench region. It is believed that these differences are not obvious from the invention of Zheng et al.

The Examiner has argued that the invention of Detzel et al. makes the use of a polishing pad having a hardness of at least Shore "D" 52 obvious. While Detzel et al. lists "a hardness of 25 to 80 Shore D" as one of the parameters of a "most preferred pad", see column 4, lines 13-22 it is believed that Detzel et al. do not make the above identified differences between Claims 1-19 and Zheng et al. obvious extensions of Zheng et al.

We do not disagree with the Examiners argument that Zheng et al. describe a silicon substrate having devices formed therein, a dielectric of silicon dioxide deposited using high density plasma chemical vapor deposition, trenches being shallow trench isolation trenches, forming a pad oxide on the substrate, forming a layer of silicon nitride on the layer of pad oxide, and forming trench openings in the layer of pad oxide and layer of silicon nitride. However we disagree with the Examiners argument regarding Zheng et al. describing the use of resist or photoresist. Zheng et al. do not describe the deposition, curing, or removal of resist or photoresist.

It is believed that Claims 1-19 are different from, not obvious from, and patentably distinct from Zheng et al. in view of Detzel et al. for the above described reasons. Reconsideration of the Rejection of Claims 1-19 under 35 U.S.C. 103(a) as being unpatentable over Zheng et al. in view of Detzel et al., and Allowance of Claims 1-19, are requested.

It is requested that should Examiner Isaac not find that the Claims are now Allowable that the Examiner call the undersigned Agent at (845)-462-5363 to overcome any problems preventing allowance.

Respectfully submitted,



A handwritten signature in cursive ink, appearing to read "Larry J. Prescott".

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